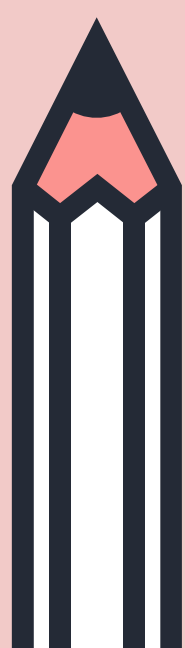
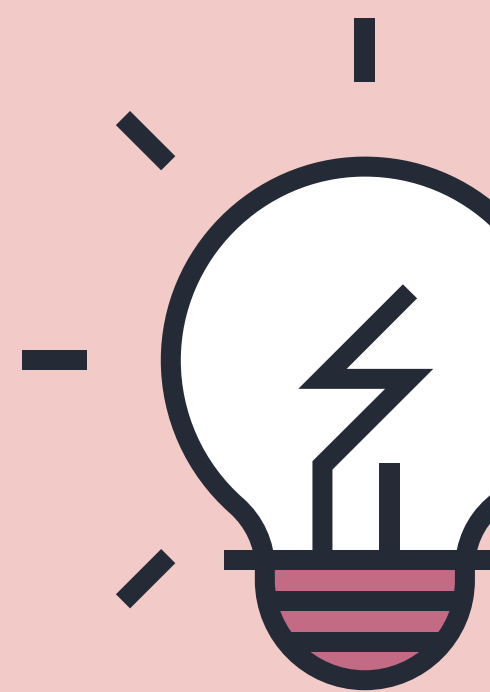
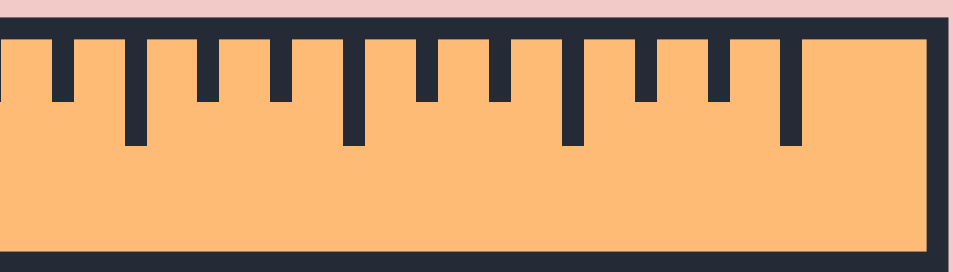


# Memory: A Lesson Plan



## **Topic : Memory**

### **Learning intention**

Introduce the topic of memory and its fallibility through a false memory task. The results of the experiment will be explained through the Fuzzy Trace theory of memory.

### **Aimed at:**

This lesson is designed for children between the ages of 8-12

### **Length:**

Approximately 30 minutes

### **Essential materials :**

Printed copy of resource B & D  
Pen

### **Optional materials:**

Prize  
Printed copy of resource A

## **Background information for teachers**

Memory is the faculty used by the brain to store information. It is a record of the past which provides information that guides our actions in the future. A key feature of memory, which feels counterintuitive, is its malleability. Memory is not, as many believe, simply a recorded version of what we have experienced. Instead, it is a representation created by the brain and therefore it can be influenced, intentionally or unintentionally.

### **Deese-Roediger-McDermott Paradigm**

The DRM paradigm is a great way of demonstrating the malleability of our memory and how we can come to 'remember' false information. The DRM deliberately induces false recall by presenting a list of words (juice, bowl, salad) which have a strong association with a non-presented lure word (fruit). Typically, the lure word is recognized and 'remembered' with the same confidence as the words that were actually presented.

### **Fuzzy trace theory**

One explanation for this effect is the fuzzy trace theory of memory. This dual process theory suggests memories are contributed to by two channels or traces which represent past events differently. The verbatim channel is a literal representation of the precise details of an event, whilst useful this is not a very efficient representation and verbatim traces become inaccessible after a shorter period of time. The gist channel is a 'fuzzy' representation which is concerned with the overall meaning of a past event. Despite its inferior accuracy, research shows people prefer to reason with gist traces. Early research thought the two channels may act serially, with verbatim traces leading to gist traces. However, it was found that they actually function in parallel, encoding different characteristics of a past event simultaneously.

For true memories, the representation of a past event is supported by both the gist channel and the verbatim channel which both contribute to the encoding of a valid memory.

False memories are the product of the gist channel, which responds to ideas and concepts which 'feel' familiar. The verbatim channel will work in opposition to try and suppress the familiarity if the details are incongruent. However, the faster decay of verbatim traces is one of the factors which prevents this, allowing the gist channel to create a false memory.

# The Deese-Roediger-McDermott Paradigm

## Method:

- Resource B is distributed, placed facing down in front of every participating student.
- Students are instructed that they will hear a list of 10 words which they must try and remember.
- The list can then be read aloud (Resource C)
- Resource D can then be used to complete an animal naming task. The pictures can be shown to the class and they must simply name the animal. This task is not important in itself, it just acts as a distraction.
- Then students are instructed to turn over the sheet in front of them and circle the words that were read aloud. The sheet contains all words read, the lure word and some distractor words.

Once the task has been completed the answers can be revealed. For maximum impact, the lure word should be written down before hand and revealed, to prove the memory was deliberately implanted

## Suggestion:

Adding an incentive such as a prize for the most accurate response, could help the task feel more like a game and increase engagement with younger students.

## Discussion:

At this point, it is important to draw attention to how many of the children fell into the trap of the lure word. Discussion, in small groups or as a class, can focus on how the false memory feels and how it was difficult, for most, to differentiate it from a true memory

Resource A can then be utilised, either printed and distributed or displayed on a screen to introduce the Fuzzy Trace theory of memory. The important take away message of this, is that our memories are not just exact replications of events as they happened, instead our brain works to create a representation through two channels and the outcome of that is what we consider our memory. As was demonstrated this process can be influenced so our memory is not always completely accurate.

## Extension:

With older children, the implications of today's learning could be discussed. Small groups of children could be asked to come up with ideas for what the flexibility of memory means for society.

Examples to prompt if necessary:

- Eye witness testimony in trials
- Autobiographical reports of historical events

# Why did we remember the word sleep when it wasn't there?

**The fuzzy trace theory** is an idea about how our brains create memories. Fuzzy trace theory helps us understand how false memories happen. This is the idea that our brain thinks about past events in two separate ways, called channels.

The **Verbatim Channel** represents past events specifically and accurately. Making sure all the fine details are captured

Hi! I'm the verbatim channel. I focus on the precise details of a past event.



Hello! I'm the gist channel. I like to focus on the general meaning of a past event.



The **Gist Channel** likes the big idea when representing past events. It tries to capture the overall concept.

In the task you just completed the gist channel categorised all the words as 'sleep related' which is why some of you recognised the word just like the others that were actually read out.

I'm thinking of the individual words. Sleep wasn't one of them.



Sleep! That feels like a familiar idea.



ummm...



Sleep feels familiar so I must have heard it!



If you didn't circle the word sleep, this was because your verbatim channel was able to be heard, telling your brain the fact the word sleep was not actually read aloud.

If you did circle the word sleep, this is because your gist channel took over and the information from the verbatim channel was not able to be used. This means the gist channel gave incorrect information, creating a false memory

**Pillow**

**Good**

**Dog**

**Time**

**Bed**

**Life**

**World**

**Hand**

**Couple**

**Tired**

**Think**

**Night**

**Eye**

**Blanket**

**Sleep**

**Yawn**

**Point**

**Round**

**Work**

**Peaceful**

**Crazy**

**Group**

**Storm**

**Dream**

**Week**

**Truth**

**Strong**

**Soundly**

**Loud**

**Rested**

To be read aloud

**Pillow**

**Bed**

**Tired**

**Night**

**Blanket**

**Yawn**

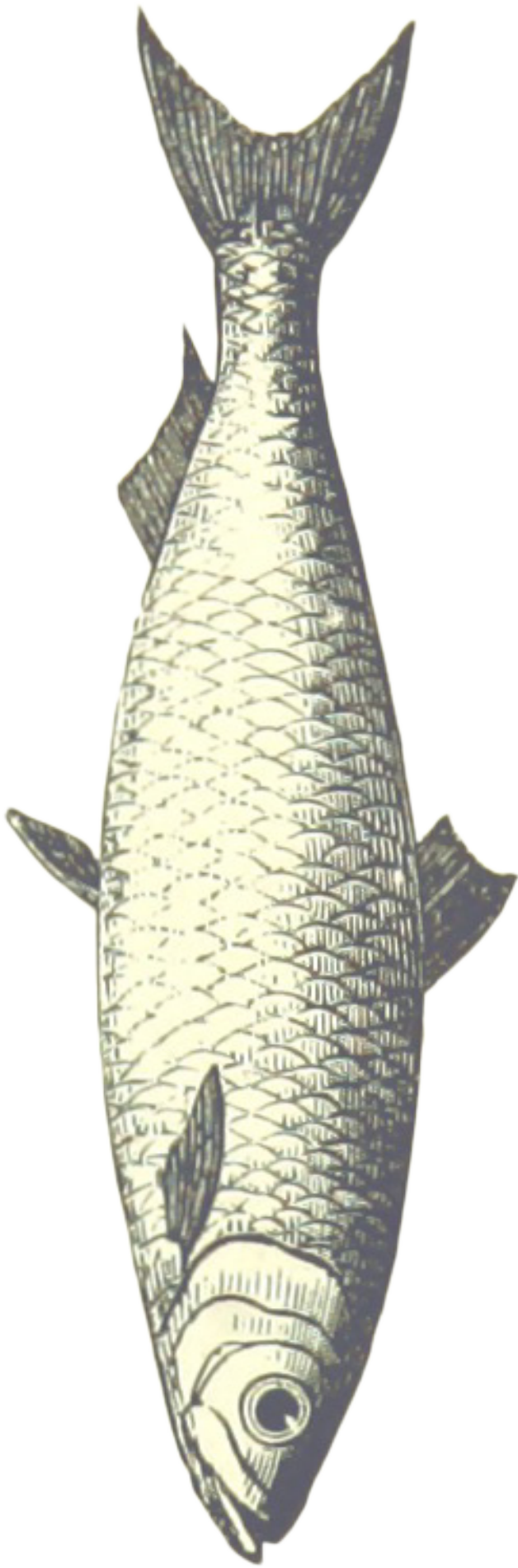
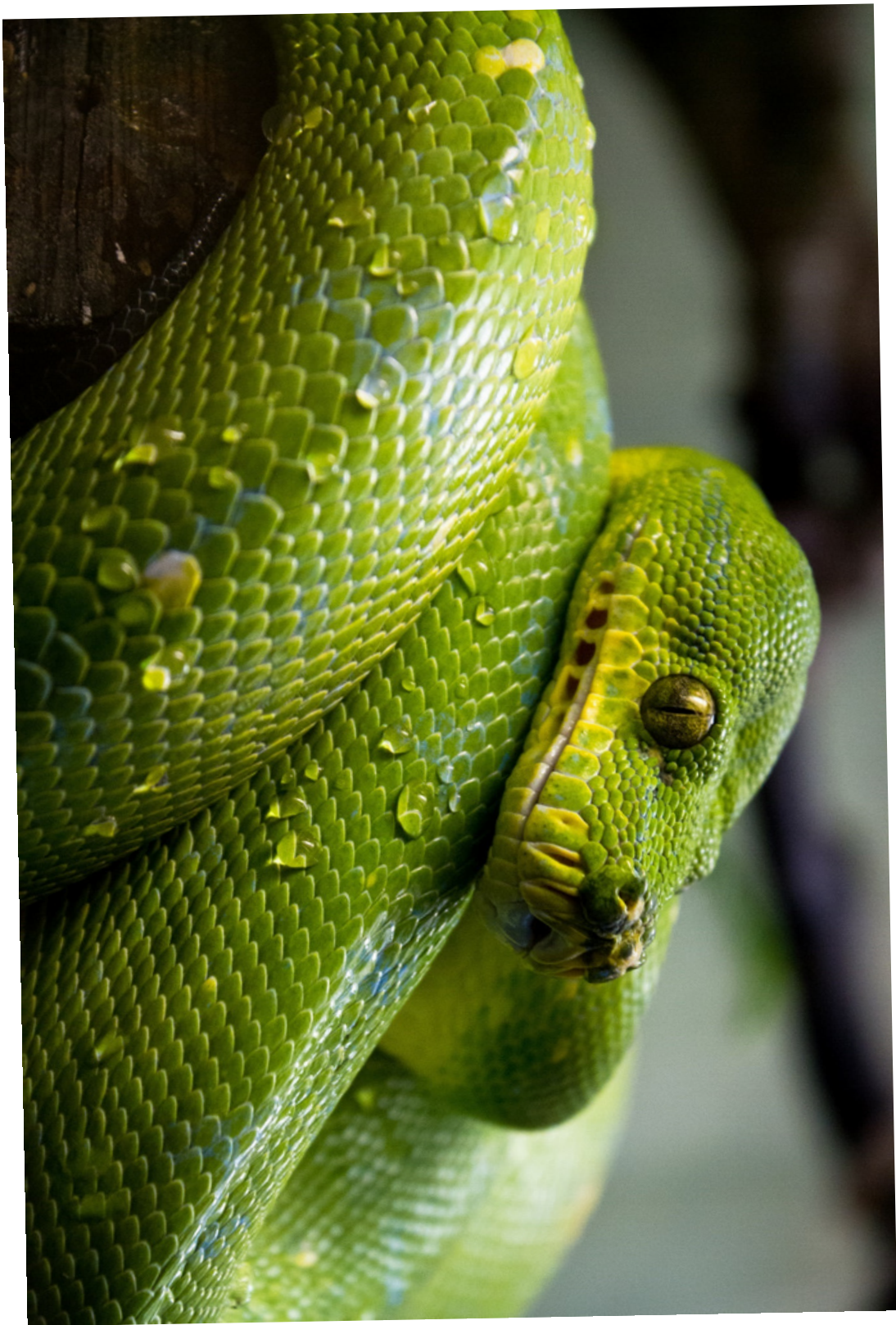
**Peaceful**

**Dream**

**Soundly**

**Rested**









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## References

- Gallo, D. (2010). False memories and fantastic beliefs: 15 years of the DRM illusion. *Memory & Cognition*, 38(7), 833-848.
- Metzger, R., Warren, A., Shelton, J., Price, J., Reed, A., & Williams, D. (2008). Do children "DRM" like adults? False memory production in children. *Developmental Psychology*, 44(1), 169-181.
- Miller, P., & Bjorklund, D. (1998). Contemplating Fuzzy-Trace Theory: The Gist of It. *Journal of Experimental Child Psychology*, 71(2), 184-193.
- Pardilla-Delgado, E., & Payne, J. (2017). The Deese-Roediger-McDermott (DRM) Task: A Simple Cognitive Paradigm to Investigate False Memories in the Laboratory. *Journal of Visualized Experiments*, 4 (119).
- Reyna, V., & Brainerd, C. (2011). Dual processes in decision making and developmental neuroscience: A fuzzy-trace model. *Developmental Review*, 20(1)
- Sugrue, K., & Hayne, H. (2006). False memories produced by children and adults in the DRM paradigm. *Applied Cognitive Psychology*, 20(5), 625-631.

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